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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/733,738	12/11/2003	David B. Allen	2003P14124US	8398

7590 04/29/2008
Siemens Corporation
Intellectual Property Department
170 Wood Avenue South
Iselin, NJ 08830

EXAMINER

MILLER, DANIEL H

ART UNIT	PAPER NUMBER
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1794

MAIL DATE	DELIVERY MODE
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04/29/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.



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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 10/733,738
Filing Date: December 11, 2003
Appellant(s): ALLEN, DAVID B.

For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 5/29/2007 appealing from the Office action mailed 8/11/2006.

(1) Real Party in Interest

David Allen

Siemens Westinghouse Power Corporation

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

No amendment after final has been filed.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

Schaefer et al	(US 4,735,656)	April 5, 1998
Freling et al	(US 6,190,124)	Feb. 20, 2001
O'Hara et al	(US 6,896,485)	May 24, 2005

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schaefer et al (Schaefer, US 4,735,656).

Schaefer teaches an abrasive tip material for turbine blade tips (abstract). The abrasive material comprises MCrAlY matrix with ceramic particles dispersed therein (see claims 1, 3 and 11 of reference). The ceramic particulate may be a mixture of ceramics such as BN and SiN (see claim 11 reference).

Schaefer does not specifically teach the amounts of ceramic particles to be added.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use amounts of SiN and cBN that provide the desired abrasiveness to the coating, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art (*In re Aller*, 105 USPQ 233). SiN and cBN have

known values of hardness and durability as well as other physical characteristics; therefore one of ordinary skill would have found it obvious to vary the amounts to achieve the desired abrasive quality in the coating.

Claims 4, 5, 7-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schaeffer et al (US 4,735,656) in view of Freling et al (US 6,190,124).

Schaeffer teaches an abrasive tip material as discussed above, but does not teach additional compositions of MCrAlY or specifics of the ring segment with which the tip comes into contact.

Freling teaches a seal system including an abrasive tip and an abradable seal surface, and further teaches that typical abrasive tips comprise a plurality of cBN grits surrounded by an electroplated metal matrix (column 8 and table 2). The metal matrix may be MCrAlY where M is a mixture of Ni and Co (column 4, line 50-67).

One of ordinary skill in the art would have found it obvious to use alternative compositions of MCrAlY as taught by Freling in the article of Schaefer, as it is clearly demonstrated to be used successfully in combination with similar ceramic particles in a similar environment.

Furthermore, one of ordinary skill in the art would have found it obvious to use the abrasive tip of Schaeffer with an abradable seal surface like that taught by Freling, as it is clearly taught to be a common coating for abrasive tips used in conjunction with abradable coatings of YSZ. The coating can comprise about 3 to 25 % wt. Zirconium oxide and stabilizer (yttrium oxide; column 3 line 5-15).

Claims 4, 5, 7-15, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schaeffer et al (Schaeffer, US 4,735,656) in view of O'Hara et al (O'Hara, US 6,896,485).

Schaeffer teaches an abrasive tip material, as discussed above, but does not teach additional compositions of MCrAlY or specifics of the ring segment with which the tip comes into contact.

O'Hara teaches a seal system including an abrasive tip and an abradable seal surface, wherein the abrasive tip comprises MCrAlY, formed mainly of Fe, Ni, Co, Cr, Al, and Y, and abrasives formed mainly of cBN, alumina, Sic, or diamonds (column 3, lines 5-15 and 22-30).

One of ordinary skill in the art would have found it obvious to use alternative compositions of MCrAlY as taught by O'Hara in the article of Schaefer, as it is clearly demonstrated to be used successfully in combination with similar ceramic particles in a similar environment. Furthermore, one of ordinary skill in the art would have found it obvious to use the abrasive tip of Schaeffer with an abradable seal surface like that taught by O'Hara, as it is clearly taught to be a common coating for abrasive tips used in conjunction with abradable coatings of YSZ.

(10) Response to Argument

Regarding the 102 rejection over Shaefer, the properties of superior cutting properties (hardness) of the cubic boron nitride and greater resistance to thermal degradation of the silicon nitride are well known in the art.

Schaefer teaches the combination of cubic boron nitride and silicon nitride. Therefore, it would have been obvious to provide, as in appellant's claim 2, both boron nitride and silicon nitride seeking to maintain a desired hardness while providing greater resistance to thermal degradation in turbine engine environment. Cubic boron nitride is desirable in abrasive materials because of its proven cutting capability. With the goal of maintaining such cutting capability in mind, one of ordinary skill would have through routine experimentation optimized the percentage of each material in order to maintain a desired hardness while providing greater resistance to thermal degradation in turbine engine environment. It has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art (*In re Aller*, 105 USPQ 233).

Regarding Schaeffer, appellant argues that the abrasive coating of the instant claims has surprisingly proved to efficiently retain the benefits of each material system. Appellant states that including substantially greater amounts of cBN relative to SiN would cause degradation, and reversing this proportion would decrease the cutting ability. The instant specification states on page 6 that relative amounts of the abrasives can be varied to suit the specific engine application, which would further imply that one of ordinary skill would be able to adjust the amounts of abrasives based on the desired function. Schaeffer clearly teaches that both SiN and BN may be used together in the

abrasive tip. It is maintained that one of ordinary skill in the art would have found it obvious to adjust the amounts of the two abrasives based upon their known hardness and durability to form an abrasive tip suitable for the specific engine application.

In response to appellant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the appellant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

Regarding the 103 rejection over Schaeffer in view of Freling, one of ordinary skill in the art would have found it obvious to use alternative compositions of MCrAlY as taught by Freling in the article of Schaefer, as it is clearly demonstrated to be used successfully in combination with similar ceramic particles in a similar environment. Furthermore, one of ordinary skill in the art would have found it obvious to use the abrasive tip of Schaeffer with an abradable seal surface like that taught by Freling, as it is clearly taught to be a common coating for abrasive tips used in conjunction with abradable coatings of YSZ.

Regarding the 103 rejection over Schaeffer in view of O'Hara, one of ordinary skill in the art would have found it obvious to use alternative compositions of MCrAlY as taught by O'Hara in the article of Schaefer, as it is clearly demonstrated to be used

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successfully in combination with similar ceramic particles in a similar environment.

Furthermore, one of ordinary skill in the art would have found it obvious to use the abrasive tip of Schaeffer with an abradable seal surface like that taught by O'Hara, as it is clearly taught to be a common coating for abrasive tips used in conjunction with abradable coatings of YSZ.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Daniel Miller/

Daniel Miller

Examiner, Art Unit 1794

Conferees:

Keith Hendricks

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